# Chapter 6 -- DIRECTIONS FOR FUTURE GROUNDWATER PROTECTION

The Groundwater Coordinating Council (GCC) is directed by statute to include in its annual report a "list and description of current and anticipated groundwater problems" and to "set forth the recommendations of the Council" (s. 15.347(13)(g), Wis. Stats.). The purpose of this Chapter is to call attention to statewide priorities in the area of research, monitoring, policy, planning, and coordination related to groundwater and to provide direction to the GCC and its Subcommittees. In addition, this Chapter sets forth the Council's recommendations for future groundwater protection and management needs to state agencies, the Governor, the Legislature, and the citizens of Wisconsin.

## *PRIORITY RESEARCH & MONITORING NEEDS/ISSUES*

- **Restore adequate funding for groundwater monitoring and research**: State budget cuts have limited the amount of groundwater research and monitoring projects that were funded in recent years (see Table 3 in Chapter 2). DNR's state funding for projects has been cut since FY 02 and has been forced to use more Federal dollars with high overhead costs. Although relatively new Wellhead Protection and Groundwater Quantity funding has offset some of these DNR cuts the new funding is earmarked towards a limited scope of work. The UWS budget was cut by 10% in FY 04 and FY 05. DATCP and Commerce have been unable to fund any new projects in the last three fiscal years. Continued cuts will hamper the State's ability to address critical groundwater monitoring and research needs in the future. Research and monitoring are necessary to identify cost-effective prevention strategies. These strategies are needed to prevent problems from being established in the subsurface that are much more time-, labor-, and cost-intensive to remediate than to prevent in the first place. Without adequate funding for research and monitoring we don't know what the best prevention strategies are. The GCC encourages its member agencies and the Legislature to restore adequate resources for groundwater monitoring and research and to seek partnerships to leverage additional funds.

- **Acute and chronic impacts to groundwater from manure management:** Groundwater contamination resulting from manure disposal has been an increasing problem in recent years for private well owners. A statewide assessment is needed to understand the scope and magnitude of the problem. Mechanisms, pathways, and timing of movement into groundwater, the influence of landscape settings and climatic factors, the applicability of new analytical tools and methods of vulnerability assessment and best management practices (BMPs) and the threat of associated contaminants (bacteria, nitrates, pharmaceuticals, viruses, other pathogens, etc all need to be understood better to address the problem.

- **Investigate adverse impacts from groundwater withdrawals:** Recent headlines about lakes and streams drying up, long term water supplies in the Fox River Valley, and severe drawdowns in southeastern Wisconsin have generated many questions about the effects of groundwater withdrawals on surface waters and long-term groundwater availability. There is a need to further quantify hydrographic relationships between surface and groundwater, as well as to develop tools to evaluate the impacts of withdrawals on surface waters. The GCC should continue to encourage research efforts that will provide information useful in

addressing this issue.

- **Investigate extent and causes of naturally occurring substances in groundwater:** Continued problems of elevated arsenic, low pH, and other water quality problems in domestic wells exist over large areas of northeast Wisconsin. Additionally elevated sulfate, total dissolved solids (TDS), and radium have been found in some new deep municipal wells in the Lower Fox River Valley, making the wells difficult to use. In some other existing deep wells as far south as Milwaukee, the TDS have been steadily increasing over the years. These sulfate and TDS levels pose a problem for local water managers, and the origin of the dissolved solids is not completely understood. The State needs more information about the extent and causes of these problems in order to give advice to homeowners, municipalities, and well drilling contractors. The GCC should continue to encourage research efforts that will provide information useful in addressing these issues.

- **Evaluate occurrence of recently discovered groundwater contaminants:** Recent research conducted in Europe and the U.S. indicates that traces of pharmaceuticals (including antibiotics and hormones) and pesticide breakdown products are common contaminants found in groundwater and surface water. In addition, studies have found evidence of viruses and other microbial agents in both municipal water supplies and domestic wells. Research is needed to determine whether these substances pose a threat to Wisconsin's groundwater resource, and also to human health.

- **Research land use management and its impact on the groundwater resource:** Additional research is needed on the effect of various land uses (e.g. urbanization and agriculture) on groundwater quality and quantity. For example, recently enacted stormwater infiltration rules help reduce runoff in urban areas, but the effects on groundwater quality are largely unknown. Similarly, agricultural nonpoint source rules require nutrient management plans that protect surface water quality, but may also improve groundwater quality. Projects must be managed in such a way as to maximize their relevance to state land use problems. This issue crosses agency lines and promises to be an important issue for years to come.

- **Identify potential groundwater quality issues associated with innovative water management tools.** Aquifer Storage and Recovery (ASR) and Enhanced Aquifer Recharge are two techniques that are being explored in Wisconsin and other parts of the world to address long-term water supply needs in water-limited areas. These tools may help communities meet water demands during peak use periods or help mitigate adverse effects of long-term water withdrawals. However, the long-term effects on water quality and aquifer geochemistry are relatively unknown, especially in areas with existing water quality issues (e.g. arsenic and radium). Research is needed on a variety of levels in order to evaluate whether these tools are appropriate for Wisconsin.

## *PRIORITY POLICY & PLANNING NEEDS/ISSUES*

- **Address groundwater quantity management issues at both statewide and regional levels:** Groundwater quantity issues came to the forefront of public discussion in FY 04, with the development and passage of landmark groundwater quantity legislation, 2003 Wisconsin Act 310. In FY 05 and FY 06 the DNR began to implement the new law and the Groundwater Advisory Committee began to address specific policy issues related to groundwater management planning. There is a clear need for proactive regional groundwater

planning in areas of concern, where development/population growth pressures intersect limited groundwater resources. The GCC will continue to serve as a resource for addressing scientific and technical questions related to groundwater quantity and facilitate further dialogue among all parties on potential approaches and solutions.

- **Provide resources to local governments for Smart Growth/Comprehensive Planning activities**. Recent legislation has required local units of government to develop a comprehensive plan by 2010 in order to undertake land use activities. This plan must address nine elements, including natural and agricultural resources, housing, utilities, and land use. This planning process presents a unique opportunity to address and implement groundwater protection at the local level. Through the Local Government and Planning Subcommittee, the GCC will seek ways to assist local communities in their planning efforts to encourage groundwater protection.

- **Find solutions to groundwater nonpoint pollution problems**: A 2002 DATCP report indicates that 37.7% of wells contain a detectable level of at least one herbicide or herbicide metabolite and 11.1% of Wisconsin's wells still contain detectable atrazine residues. In addition, 14% exceed the nitrate standard. These rates are substantially higher in agricultural areas. More work is needed to determine how far Wisconsin groundwater will deteriorate without a substantial change in farming practices, and what practices will sustain both agriculture and groundwater quality. The GCC will support the agencies and the UWS in obtaining information pertinent to the human health implications of consuming nitrate and pesticide contaminated groundwater and the effect of discharge of this groundwater on surface waters and their ecosystems.

## *PRIORITY COORDINATION NEEDS/ISSUES*

- **Support implementation of a Statewide Groundwater Monitoring Strategy:** Chapter 160 of the Wisconsin Statutes requires the DNR to work with other agencies and the GCC to develop and operate a system for monitoring and sampling groundwater to determine whether harmful substances are present (s. 160.27, Wis. Stats.). In FY 04, several agencies worked together to develop a Statewide Groundwater Monitoring Strategy to guide agency monitoring efforts for the next ten years. In FY 06 the strategy was incorporated into the DNR Water Monitoring Strategy (*http://dnr.wi.gov/org/water/monitoring/strategy.htm*.) The GCC encourages agencies, the university, and federal and local partners to implement the various components of the strategy and to seek funding to support its implementation.

- **Coordinate and facilitate consistent messages on groundwater related issues:** The public has benefited from the consistent educational messages that have been endorsed by the GCC. Through the Education Subcommittee, the GCC will continue to provide its leadership and assistance to state agencies that provide educational materials to the public. In FY 05, the Subcommittee launched a "Groundwater Information Network" with non-governmental organizations to further its mission of promoting consistent messages regarding groundwater protection and building a groundwater constituency. The GCC will continue to use this network and other means to promote water stewardship and awareness of water quantity issues, find innovative ways to encourage testing of private water supplies, and provide materials for local communities to support comprehensive planning activities.

- **Promote consistency between the agencies on data management issues:** Through the

DNR's groundwater data system (GRN) and the GCC's Directory of Groundwater Databases, state and local government agencies now have more convenient access to groundwater data. This effort must be maintained by continuing to identify data needs and ways to make data easily accessible. Data consistency must be promoted by use of common geographical locators and minimum data elements for use in a GIS environment. In 2002 the GCC's Monitoring and Data Management Subcommittee produced *Recommended Minimum Data Elements for Groundwater Databases* (http://dnr.wi.gov/org/water/dwg/gw/pubdnld.htm*)* to guide groundwater database architects towards multi-user-friendly data element choices. The GCC will continue to provide leadership and communication on data management through its subcommittees. This continued effort displays the GCC's commitment to management of the resource through sound scientific methods.

- **Ensure access to findings of groundwater research and monitoring projects:** More than 120 summaries of groundwater-related monitoring and research projects funded through the Wisconsin Groundwater Research and Monitoring Program are now available online. The WRI Water Resources Library digitized and put online the full text of most WRI and selected DNR project final reports. To maintain and enhance this resource it will be important to add new summaries and reports as they become available, create a more visually appealing set of front-end pages for the site, and publicize the web site location and content more widely. Another WRI initiative is the development of topical fact sheets to summarize research and monitoring findings relative to important groundwater issues in the state. The GCC supports development of these fact sheets and resources and will continue to promote ways to translate sound science into effective groundwater management strategies.